[redacted]

[redacted]

25X1

25X1

25 January 1967

[redacted]

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[redacted]

25X1

Subject: [redacted] Progress Report
December 1966 - Project [redacted]

25X1

Gentlemen:

Enclosed is a copy of [redacted] Progress Report on Project [redacted] for the period December 1966.

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Also included is our Financial Report for this period.

Very truly yours,

[redacted]

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LHB/aw

Encl: (1) P. R.
(2) F. R.

[redacted]

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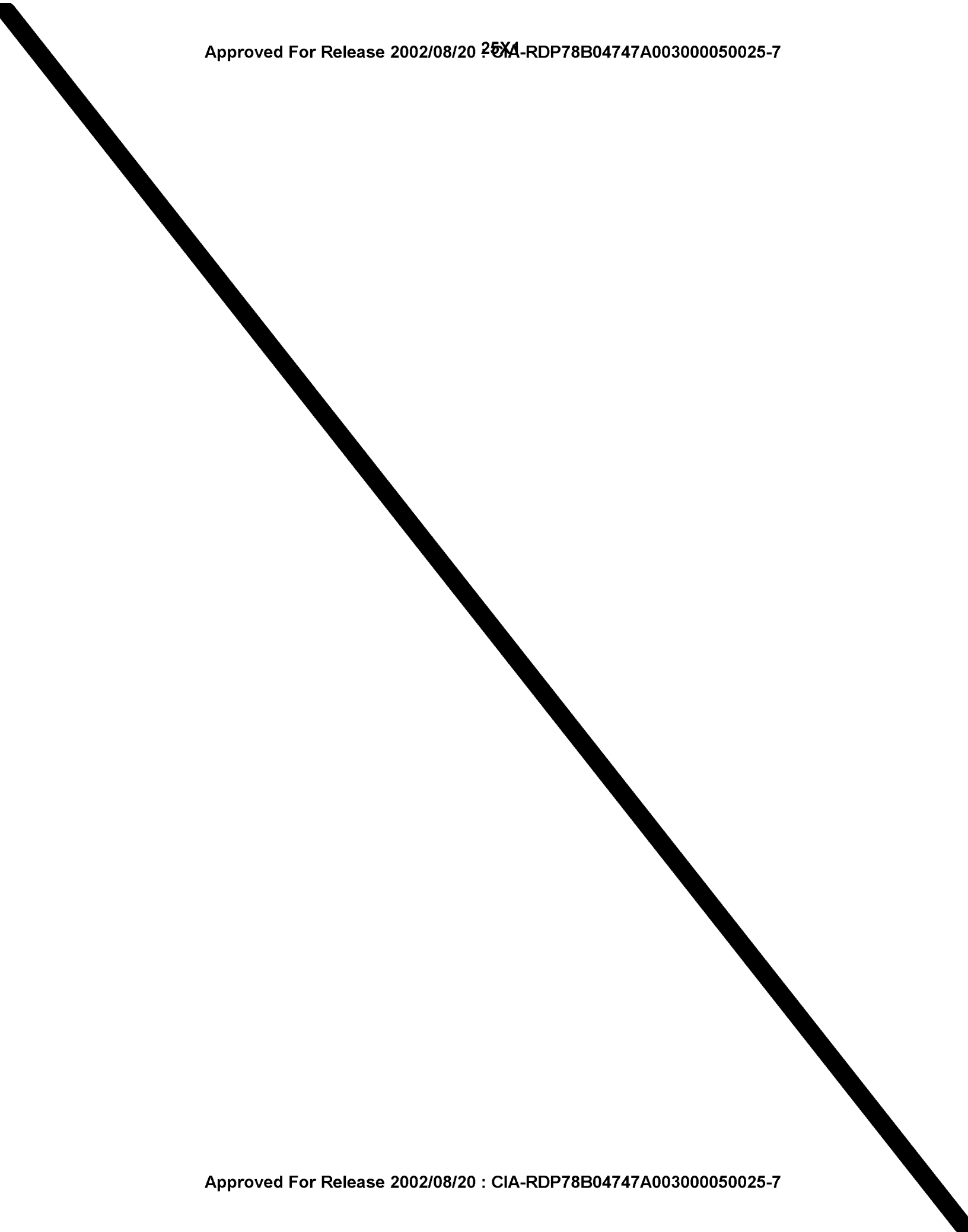

Approved For Release 2002/08/20 : CIA-RDP78B04747A003000050025-7

25X1 [redacted] PROGRESS REPORT
25X1

Period Covered: December 1966

25X1 Document No.: [redacted]

A. PRESENT STATUS

25X1 [redacted] The equipment is ready for delivery with exception of final inspection by [redacted] Quality Control 25X1
Department. Photographs # 867, 868, 866, and 870 are included
25X1 showing various views [redacted]

A solution to the lamp flicker problem has been found and appropriate changes in the equipment made. The approach of attempting to isolate the lamp and noise producing circuits by electrical filtering proved unsuccessful. The component of the noise found to be the trouble source was identified as a low frequency distortion of the input waveform due to relatively high, short duration, current surges in the motor control circuit. This harmonic distortion of the input wave form could only be eliminated by separating the sources of input power to the lamp and motor control circuit. Filtering of this distortion was ruled out because of the large, heavy, and expensive equipment which would have been necessary. The manufacturer of the dimming circuit was approached for possible solutions. Filtering circuits were supplied and also a slightly different dimmer design, however this did not improve the situation. When all promising avenues to the

25X1

solution had been attempted, we found it necessary to design and fabricate a new dimming circuit which was insensitive to lamp flicker. This was done on a crash basis since this problem was

25X1 delaying both [redacted] completion. The final circuit selected uses a solid state switch [redacted] whose turn-on signal is 25X1 controlled by an SCR driven by a unijunction transistor. Lamp intensity is controlled by varing the period of time (or phase angle) the 115 volts is applied to the transformer primary during each half cycle. This is similar to the method used in the original dimmer however the important difference is in the method of triggering the solid state switch. In the original switch the trigger

25X1 circuit was sensitive to voltage variations on the line; in the [redacted] circuit this sensitivity is eliminated by operating the trigger timing circuit from a zener diode controller reference. In addition the new circuit has provision for the changing the turn-on phase angle in a direction which compensates for the reduced voltage being supplied to the load due to wave form distortion. Some difficulty was experienced in achieving the required dimming range without lamp flicker (due to the lamp's normal instability when operating at the low end of the brightness range). It was found that better performance resulted when a load resistor was placed across the primary of the high voltage transformer at the low end of the dimming range. Since it was not practical or desirable to keep this resistor (artificial load) connected across the load for the bright lamp settings (because of excessive power dissipation - and instrument temperature rise) a means had to be found to automatically remove it as the brightness was increased. The brightness control was modified to include a switch which operated at approximately mid range disconnecting the extra stabilizing load toward the bright end of the range.

The same new dimming circuit will be used on the [redacted] 25X1 machine.

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B. PROBLEM AREAS

1) High Intensity Light Sources

The high intensity light sources [redacted] 25X1 are obtained by optically piping light from an incandenscent bulb (with condensing lenses) through a fiber optic cable and projecting a cone of light up through the film with a mirror and fresnel lens assembly. The mirror and fresnel lens is supported on a permanent magnet assembly which is coupled through magnetic attraction to a master magnet supported under the microscope rohomboid. There are of course two masters and two slave assemblies corresponding to the two rhomboids.

There are a number of small problems associated with this arrangement. Optical geometry and the size of magnets required to get reasonable performance results in a slave assembly which causes interference with the center shade. It appears now that it will not be possible to use the center shade on the [redacted] 25X1 unit, however this possibility was discussed with the contractors technical representative when [redacted] agreed to add the 25X1 25X1 center shades [redacted]

During the customers technical representatives recent visit, comments were made about the color of the high intensity light and about the appearance of the rings on the fresnel lens when viewing through the microscope. The customers technical representative asked that these problems be corrected. We plan to install a blue filter to eliminate the red-yellow hue now present (due to use of an incandescent lamp and blue attenuation in the fiber optic cable). In regard to the visibility of the fresnel lens structure, a diffusor will be mounted over the lens between the source and the film. This will cause an attenuation of light. It is hoped that this loss will not be sufficient to effect viewing under high magnifications.

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2) Wiring and Trouble Shooting Complexities

Due to the compactness of the instrument and the necessity of having all the electronics installed within the main casting, the assembly and trouble shooting is requiring more time than originally estimated. Photograph #865 enclosed shows the
25X1 inside of the [ ] instrument. It is included only to show the complex packaging of electrical and mechanical components and to give the reader a better feel for the assembly and trouble shooting time required.

3) Overrun on Target Cost

It appears now that the [ ] instruments can 25X1
not be completed within the original target cost of the contract. This is due to a multitide of unforseen problems which have consumed large amounts of the estimated engineering and shop time. These unforseen problems did not occur until the check out and debugging stages. A letter requesting overrun funding has been submitted to the contracting officer.

C. PROJECTED WORK FOR JANUARY

25X1 [ ] Unit will be shipped.

25X1 [ ] Unit will be completed and made ready for inspection by the customers technical representative. This will include the addition of diffusors and color correction filters on the high intensity light sources.

D. SUMMARY OF CORRESPONDENCE

25X1 1) Visit [ ] by customers technical repres-
25X1 entative [ ] 12-22-66 [ ] visited [ ] to inspect 25X1
25X1

25X1 [redacted] Unit was not fully operational, however the high intensity
25X1 light source was demonstrated. [redacted] requested that the visibility 25X1
of the fresnel lens when viewing through the microscope be reduced
and the color of the light be changed more toward blue. [redacted] 25X1
indicated this would be done.

25X1 2) Letter [redacted] to contracting officer 12-29-66
25X1 [redacted] requesting additional funds to continue work

E. FINANCIAL REPORT

Financial Report for month of December is enclosed.